# American Journal of Pharmacy

AND THE SCIENCES SUPPORTING PUBLIC HEALTH

AMERICAN JOURNAL OF PHARMACY VOL 123 NOVEMBER 1951 NO 11

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# AMERICAN JOURNAL OF PHARMACY

AND THE SCIENCES SUPPORTING PUBLIC HEALTH

Since 1825



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# E D I T O R I A L

## RELIGIOUS FREEDOM OR BIGOTRY?

RELIGIOUS freedom is a concept which is cherished by most Americans since indeed it was religious persecution which led many of our forefathers to leave Europe and seek this new land of freedom. It is a well established tenet of our democracy that each man has the inalienable right to worship as he pleases or not at all if he so decides. Largely as a result of this freedom, America has become a mecca for religious cults, some so bizarre that they can scarcely be classified as a religious order.

While we are entirely in favor of religious freedom there are certain hazards in interpreting the meaning of this term. Unfortunately, certain religious groups have seen fit to interpret it in a way which demoralizes the accepted practices of society so that great harm can result.

Some parents refuse to send their children to public schools and this is generally accepted provided equal and adequate facilities are provided by a church school. Now, however, we learn that in New York State legislation has been adopted making it illegal to teach children the "germ theory of disease" if they belong to that religious sect known as "Christian Scientists." This is indeed a serious threat to educational freedom and one which must not go unchallenged.

Christian Science teaches its followers that disease is a consequence of breaking God's laws and that the use of drugs in the treatment of disease is wrong. Those who wish to believe in such a misguided philosophy should be free to do so if they wish; but it is just as imperative that those of us who think otherwise be free to speak our opinion. It is, furthermore, essential that the state in its educational services teach the children of such parents what is generally accepted as truth, even though it may conflict with their religious dogma.

To fail to teach children the established and proven theories concerning disease, its origin and prevention, is criminal negligence. Not only do they fail to learn accepted facts but, lacking them, such persons are unable to follow the usual programs of disease prophylaxis and public hygiene. This endangers others as well as themselves and is a threat to public health and welfare.

There seems to be a widespread misconception concerning the barriers which the church, any church, can erect in our educational institutions. Many educators, both public and private, disagree with the religious dogma of certain faiths. If such is the case they must be permitted to express their own beliefs documented with whatever evidence is available. To deny them this freedom is just as serious a threat to our civilization as the suppression of the church. No true educator would deny a minister, a priest or even a Christian Science "reader" the privilege of expounding the most narrow and unscientific dogma based on superstition or fear. The educator, however, must be free to teach his own beliefs as well as those of others since only thus can the student sift fact from fallacy and truth from fiction.

There is, today, serious and heated disagreement concerning religious philosophies, social and economic concepts, and the proper functions of government. The totalitarian state solves the problem by adopting an official stand on each item; that and that alone then becomes the way it must be taught, spoken of and believed by all.

We believe in the diametrically opposite method: freedom of expression, discussion, and individual choice in the end. In order that this may work it is absolutely essential that no one group, for any reason including religion, obstruct the process. Those whose ideologies and dogma are so shakily established that they fear open discussion, must not be permitted to block either our schools, hospitals or other public institutions. To permit them to do so is to surrender our American heritage of freedom. It is such reactionary thinking which in the past has led to authoritarian governments and the loss of freedom the world over. In America this must not happen.

L. F. Tice

# CURRENT TRENDS IN MODERN MEDICINALS

## (Part II—Conclusion)

By Madeline O. Holland,* D. Sc.

## DIURETICS

### Merdroxone Sodium

This new mercurial diuretic is being studied according to recent reports. It may be administered intravenously, intramuscularly or subcutaneously. The approximate onset of diuresis averaged 46 minutes following intramuscular administration to 12 patients. No toxic reactions were observed when the diuretic was given to 20 additional patients. No untoward reactions were observed following its administration subcutaneously. However, by this route the diuretic effect is somewhat delayed. Winthrop-Stearns is studying this new diuretic, Merdroxone Sodium.

### Mersalyl Analog—Compound 08879

Compound 08879, a mersalyl analog, chemically is the sodium salt of ortho-N-gamma-hydroxymercuri-beta-hydroxyethoxy-propyl carbamyl-phenoxyacetic acid. It possesses certain advantages over the other mercurial diuretics, but it still has the potential dangers of the mercurials. It has the same diuretic potency as mersalyl, but has a lower acute toxicity in mice and rats by intravenous and intramuscular injections.

### Theomersyl

A mercurial-xanthine diuretic containing Mersalyl U. S. P. and theophyllinesodium glycinate has been developed. It is claimed that this compound causes no burning or induration at the injection site. This clinically attested advantage promises new ease for patients who require prolonged diuretic medication.

The diuretic effect has been shown to equal that produced by Mersalyl and Theophylline Injection U. S. P., the mercurial and xanthine components acting synergistically to ensure more rapid absorption and prompt diuresis.

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* Editor, *American Professional Pharmacist;* Technical Editor, *El Farmaceutico* and *Pharmacy International.*

Since patients treated with mersalyl for several years have not become habituated or sensitized, this diuretic may be expected to retain its effectiveness even in conditions requiring diuresis over prolonged periods.

Central Pharmacal Co. is marketing this diuretic under the name Theomersyl.

## DRUGS USED FOR EFFECTS ON HIGHER NERVE CENTERS

### C-5986, Benodaine, Regitine, Pherentasin

In addition to the pressor substances, namely, epinephrine, arterenol and pitressin there appears to be still another pressor substance, and it also is believed to be of nerve origin in the brain. Although the chemical has not been definitely identified it does not resemble epinephrine, arterenol, pitressin, renin or angiotonin.

It can be differentiated from pitressin by the fact that it does not have a tachyphylactic effect. In addition, like serotonin it is greatly inhibited by a new drug known as 1-hydrazinophthalazine or C-5986. Pitressin is not inhibited by this drug.

C-5986 has shown value in the therapy of hypertension. From current experiments it appears that hypertension is neurogenic, but it is both humorally and neurally mediated so the nerves not only affect the blood vessel walls but also produce an agent which affects blood pressure also.

Another group of workers also have reported on a chemical in the blood of hypertension patients which is not present in blood of individuals with normal pressure. This chemical has been named pherentasin from the Greek meaning to hold up pressure. It has been recovered in a highly purified form from the blood of people with high blood pressure. When injected into rats the blood pressure is increased within five minutes and remains high for as long as 15 to 30 minutes to an hour. Examination of a number of patients revealed that pherentasin was present in practically all of those with hypertension except for those having a malignant form of the disease. Only one of a group of individuals with normal pressure had this chemical in his blood. Pherentasin is very potent.

Another advance in the handling of hypertension is the use of the adrenolytic drug 2-(1-piperidylmethyl)-1,4-benzodioxan (piperoxan, 933F) and of the adrenolytic and sympatholytic drug 2-(n-p-

tolyl-N-(m-hydroxyphenyl)-aminoethyl)-imidazoline hydrochloride (C7337) in the diagnosis of hypertension.

It is important that the patient be tested for circulating epinephrine so as to differentiate between ordinary hypertension and that due to pheochromocytoma or a paraganglioma. This can be done by means of the two drugs mentioned. Administration of piperoxan generally results in a characteristic reduction of blood pressure in patients suffering from pheochromocytoma. The second drug, C-7337, is used also for this purpose but usually is given before and during the operation for pheochromocytoma in order to prevent the occurrence of epinephrine intoxication.

Both drugs cause a reduction of blood pressure. However, that resulting from piperoxan lasts only a few minutes, whereas with C-7337 it lasts for several hours. The latter causes less side effects, is easier to administer and produces easily recognizable typical long-lasting hypotension which is evidence of a positive test. Therefore, this drug appears to be preferable for routine use. It also may be given an hour or two before and during the operation for pheochromocytoma in order to prevent paroxysms of hypertension, tachycardia, respiratory depression and other effects of epinephrine intoxication.

As a result of this study it is suggested that C-7337 be used routinely and when there is any doubt of the results piperoxan should be used to confirm the results.

C-5968 is under investigation by Ciba Pharmaceutical Products, Inc. C-7337, or Regitine, is also available from this company.

Piperoxan is available as Benodaine from Merck and Co., Inc.

## DRUGS USED IN TREATMENT OF CANCER AND LEUKEMIA

### Myelokentric and Lymphokentric Acids

Myelokentric and lymphokentric acids are excreted by patients suffering with leukemia. They appear to be mutually reciprocal in action and have proved useful in checking the wild multiplication of white blood cells in two types of the disease. Myelokentric acid stimulates the formation and development of blood cells in the bone marrow, but lymphokentric acid is necessary to prevent multiplication of the cells while they are maturing.

Neither of these acids have been found in the urine of normal individuals. They are believed to be involved in the balance mechanism of normal blood cell proliferation and maturation, but they are not considered as the etiologic agents of leukemia.

**Cortisone and Shock**

Cortisone and shock and possibly ACTH appear to be able to halt mitosis of normal cells but not cancer cells. When given to mice the skin cell mitosis was definitely affected. However, when the skin was painted with a chemical which causes cancer, mitosis continued. This is believed to be the first precise demonstration of the general belief that cancer cells are resistant to normal growth-regulating agents.

**Nitrogen Mustard**

The nitrogen mustards have been tested for some time for their efficiency in treating cancer. One of the problems has been the method of administration. Now a new technic has been developed which employs a special fine 18 gauge catheter that can be injected into the femoral artery (located in the leg) and worked up to such sites as the carotid artery in the neck or the hepatic artery serving the liver.

Thus it can be worked into cancerous areas. The tumor-destroying doses of nitrogen mustard can then be pumped into the area. There is a minimum of discomfort when the catheter is introduced. Although it is not curative it is palliative.

**Triethylene Melamine**

Triethylene melamine (TEM) possesses toxicological and therapeutic properties similar to those of the nitrogen mustards. However, it differs from the most commonly used nitrogen mustard or HN2 in that it has greater activity by weight, and it does not produce central nervous system or cholinergic stimulation in animals. In addition it can be given orally. One of the greatest disadvantages of HN2 was the fact that when given intravenously it frequently caused severe nausea and vomiting and the dosage was more difficult to control. Also, local reactions frequently developed.

TEM given orally in doses of 20 to 40 mg. for three to five weeks has been found to produce temporary periods of clinical improvement

in 58 patients with Hodgkin's disease, lymphosarcoma, chronic lymphatic and myelogenous leukemia and mycosis fungoides. The dosage schedule was adjusted to the individual patient, depending upon the diagnosis and the general condition and hematological status. More extensive studies are neceessary to determine its usefulness in carcinoma.

TEM also has been given intravenously in the aforementioned conditions in daily doses of two to three mg. until a total of 5 to 20 mg. had been administered. Like HN2 or methyl-bis (2-chlorethyl) amine, TEM is injurious to normal hemopoietic function so that the dosage must be carefully regulated.

TEM is under further investigation by Memorial Center for Cancer and Allied Diseases and Lederle Laboratories Division, American Cyanamid Company.

## ENDOCRINES

### Acthar Gel

ACTH in a repository form has been found to eliminate the need for numerous injections. After the initial treatment the gel form can be given once every one to three days instead of the previous form which is given as many as four times daily. The new gel form will not replace the lyophilized powder form but will supplement it. The same number of units will be required for therapy, but the number of injections will be reduced. In tapering off the dosage the injections may be reduced to two or three a week.

Armour Laboratories have released the product under the name of Acthar Gel.

### Chlorotrianisene

Recently there has been reported the use of a new synthetic estrogen in the treatment of carcinoma of the prostate. Known as chlorotrianisene or tri-p-anisyl-chloroethylene it is chemically similar to hexestrol and diethylstilbestrol. All three compounds have two phenyl groups separated by two carbon atoms. In hexestrol the carbon atoms are saturated whereas in diethylstilbestrol and the new compound they are not. Chlorotrianisene differs from diethylstilbestrol and hexestrol in that it has two methoxyphenyl groups instead of two hydroxyphenyl groups and the two ethyls are replaced by a methoxyphenyl and a chlorine group.

At first chlorotrianisene was given to patients in whom it appeared inadvisable to continue therapy with diethylstilbestrol. It was found that the new compound easily maintained the same effects as had diethylstilbestrol. Furthermore, it did not cause gastric irritability.

Of a group of 64 patients only nine cases have not shown improvement with chlorotrianisene. Seven of these were in the terminal phase of prostatic carcinoma. Further investigation is necessary before any final conclusions can be made, but on the basis of present studies chlorotrianisene is considered of value in the palliative therapy of prostatic carcinoma.

Known as Tace this estrogen is being investigated by the Wm. S. Merrell Co.

**Cortisone**

Cortisone is now being used in the therapy of various ophthalmological conditions such as: afflictions of the eyelid (a) blepharitis: acute, chronic, allergic (b) spastic entropion due to local irritation; afflictions of the conjunctiva (a) conjunctivitis: acute, chronic, allergic, phlyctenular; afflictions of the cornea: (a) corneal ulcer (b) interstitial keratitis (c) keratitides (d) herpes zoster ophthalmicus (e) phlyctenular kerato-conjunctivitis; afflictions of the sclera (a) scleritis (b) episcleritis; afflictions of the iris (a) iritis: acute, chronic, traumatic.

Cortisone acetate is marketed by Schering as an ophthalmic suspension containing 5 mg. per cc. The trade name is Cortogen. Merck is marketing the suspension as Cortone in strengths of 25 mg. per cc. and in ointment form, 15 mg. per Gm.

**Oral Cortisone**

Since its discovery cortisone or compound E has been administered intramuscularly. Because of the limited quantities available research on other routes of administration has necessarily been restricted.

Recently, the results of oral administration of this drug to four rheumatoid arthritis patients was reported. The dosage given was the same as that given intramuscularly.

Improvement was observed in all four patients given cortisone orally. Two patients were given the drug for ten days and from the second day showed improvement. After the drug was stopped

they relapsed immediately. The third and fourth patients were given cortisone for 20 and 19 days, respectively. Both patients showed excellent improvement in their arthritic condition.

The effects from oral administration of cortisone appeared to be smoother than when it was given parenterally according to the two last patients. The fact that cortisone is effective orally will be of value in treating chronic cases of rheumatoid arthritis. However, it is important that such use is not abused since the hormone is so potent and an excessive dosage could create more difficulties.

Cortisone for oral use is available in 25 mg. tablets as Cortone from Merck and Co.

**Cortical Hormones B and F**

The partial biosynthesis of two adrenal cortical hormones closely related to cortisone has been announced. The starting materials are the easily accessible sterols and adrenal glands of hogs. This new process makes compound B and compound F available in quantities sufficient for extensive clinical testing.

Compound F in animals is more active than cortisone, and it appears to be the predominant natural hormone.

The hog adrenals must be quickly frozen as soon as the animal is slaughtered, and they are removed. They are then ground, making a mixture of minced tissue, juices and a "'buffer" liquid in which the hormone is to be grown from one of two synthetic sterols. If compound B is desired the minced mixture is sprayed with desoxycorticosterone, readily synthesized from vegetable steroids.

After incubation and aeration for about 30 minutes the hormones are extracted. Compound B is also known as corticosterone.

If compound F or 17-hydroxy-corticosterone is desired Reichsteins compound S or 11-desoxy-17-hydroxycorticosterone also synthesized from vegetable sources is added to the minced hog gland mixture. Aeration and extraction are similar. In this process some cortisone is produced also.

The quick-freezing process under carefully controlled conditions results in more biological activity. It was developed as was the above biosynthesis by Upjohn Company research workers.

**Methostan and Stenediol**

Another new steroid, methylandrostenediol, was first reported in 1946. At that time it was concluded that in practical doses methylan-

drostenediol appeared to have no practical value in stimulating protein anabolism and growth. This conclusion probably accounts for the number of years which have elapsed before a revival of interest occurred.

As a result of the renotropic effects on experimental hydronephrosis in female mice it is now being tested in human renal disorders.

Other studies conducted in the therapy of breast cancer led to the conclusion that methylandrostenediol is a non-virilizing steroid hormone which possesses moderate protein anabolic effect and which brings about subjective well-being in breast cancer patients. In those patients studied no water retention or hypercalcemia was observed. These biochemical phenomena are frequently associated with testosterone therapy. Objective regressions of soft tissue and bone lesions occurred in three of the seven cases studied to date.

As a result of various additional studies this new compound is indicated particularly in retarded growth and constitutional diseases accompanied by protein wastage when such conditions do not respond to diet or to more specific therapy. It is important that all the precautions observed with massive testosterone therapy should be observed with the prolonged administration of this hormone.

Methylandrostendiol is marked as Stenediol by Organon, Inc., and as Methostan by Schering Corporation.

**New Hormone Key to Life**

A new hormone which activates one of the most fundamental mechanisms of life has been discovered. This hormone has the major role in the vital processes of growth and development and in the patterns of instinctive behavior. Thus it is believed that new approaches have been made to better understand these fundamental processes. The studies have been made on the giant Cecropia silkworm. This silkworm goes through three stages, the caterpillar, the pupa and the adult moth which are controlled by the secretion of a hormone in the body of the insect. This metamorphosis hormone controls not only cellular events but molecular as well. The metamorphosis is accompanied by the breakdown of certain types of proteins and the synthesis of others. This was established by extracting the proteins from caterpillars, pupae, and adult moths and injecting them into rabbits.

### STH

The somatotrophic hormone or STH is one of the new hormones isolated from the pituitary gland. It is closely related to ACTH. Both hormones should be in balance for good health for they constitute the defense department of the body. STH increases resistance to bacterial invaders. When given with ACTH it acted as a control on the ACTH.

## HORMONES

### TCP

A new form of testosterone has been developed by the Upjohn Company. Chemically it is testosterone cyclopentylpropionate (TCP), and it is longer-acting and more than twice as potent as the older forms of male sex hormone. It is non-toxic and non-irritating at dosage levels designed for human use. It is believed that the TCP may be absorbed at a slower rate in the circulation so that more efficient utilization is possible.

## IMMUNIZING AGENTS

### BCG Vaccine in Leprosy

BCG vaccine was first used against tuberculosis. Now it has been reported as having possible protective effects against leprosy.

There has been developed a new test in which red blood cells from sheep are treated with tuberculin extracted from tuberculosis bacilli. Blood serum from the patient is then added until the sheep cells agglutinate. The concentration which causes this agglutination is thus determined. Experiments have shown that a much stronger positive reaction occurs in leprosy cases than in tuberculosis cases. Although the entire significance of this test has not been determined it is possible that the resistant factors in both these diseases may be closely related. It definitely encourages trials with BCG vaccine in protecting individuals against leprosy.

## INSECTICIDES

### Dianol

Dichlorodiphenyl dichloroethane, a DDT analogue, is an active insecticide when mixed with inactive material which can be added to paint. It is suspended in the paint and is claimed to retain effective-

ness for four to five years. It can be employed with most types of interior and exterior paints including oil, water, and dry paints, as well as whitewash, casein, cement, and stucco paints.

Unuer the name Dianol this insecticide is available from Dianol Sales Corp.

## MYDRIATICS

### Compound 75 G. T.

Recently a new mydriatic and cycloplegic drug has been reported. Known as compound 75 G. T. it is considered to more closely resemble the ideal for this type of drug than those now used. It is hoped that it will replace homatropine and possibly atropine in eye refraction. It is a member of a new series of spasmolytic agents belonging chemically to the class of basic esters of substituted phenyl acetic acids. In clinical trials it has shown definite mydriatic effects with spontaneous recovery in 20 hours or less without the use of a myotic and even more rapidly if 1.0 percent pilocarpine was instilled after maximum mydriasis was obtained.

Its cycloplegic effects are greater and less persistent than homatropine. Maximum cycloplegia and recovery therefrom generally approximated maximum mydriasis and recovery therefrom. Compound 75 G. T. is being tested in a concentration of 0.5 percent in a boric acid-borate buffer of approximately pH 5.7 with 1:50,000 Zephiran added as a preservative, by Schieffelin and Co. Thus far there have been no irritating or untoward effects.

### BL 139

Another mydriatic drug is one of a series of diphenyl substituted basic amides having the chemical formula, *alpha*-diphenyl-*gamma* dimethyl-amino-valeramide. It has a marked atropine-like action and is effective in patients who have shown sensitivity to atropine. Thus far no patients have shown any sensitivity to it. Thus it promises to be of value as a mydriatic and cycloplegic drug in patients who are sensitive to the belladonna alkaloids. It required only a 0.5 percent solution of BL 139 to produce cycloplegia comparable with that due to 5.0 percent homatropine solution. A 2.0 percent BL 139 ointment was found equivalent to 1.0 percent atropine ointment both for refraction and for therapeutic use.

## NEW EQUIPMENT

### Antibiotic Mixer

The physician or pharmacist generally mixes the antibiotic preparation as it is to be used. Now there is available a device which enables the antibiotic to be made up ready for use and stored for two weeks or more without refrigeration. It consists of a simple rubber cylinder threaded at each end. One end takes the powder bottle and the other the diluent. The powdered terramycin and diluent flow together and mix without loss of content or danger of contamination. When the mixture is accomplished the two bottles are disconnected and the one containing the solution capped and dispensed.

This mixer is available from Chas. Pfizer and Co., Inc.

### Artificial Kidney

A comparatively new prosthetic device, an artificial kidney, has saved the lives of patients suffering from extreme post-operative shock. After surgery the function of the kidney may be impaired so that the urine is retained for a sufficient length of time that life is endangered. The device consists of a plastic or cellophane tubing through which passes the arterial blood into an exterior tank where waste products are removed by dialysis. Thus, the kidney does not correct the condition of anuria, but it serves as a substitute for normal kidney function.

### Blood Fractionator

A blood fractionator has now been developed which collects blood from the donors and immediately automatically separates it into plasma and red cells. As a result of this development the blood-collecting agencies may in the future be able to stockpile plasma and red cells for greater lengths of time and in considerably larger quantities than can be done at present.

With the new fractionator the blood flows from the arm of the donor directly into a small centrifuge where plasma is separated while the blood is being given. The first stage is the removal of calcium in the first tube through which it passes. It is then cooled and passed through a centrifugal separator where the heavier cells are removed from the plasma. An automatic process-timing device regulates the distribution of the components into their respective con-

tainers. Without breaking the hermetic seal the centrifuge can be removed as a complete unit for use elsewhere or for storage. American Optical Co. has developed this fractionator.

**Buttons and Plastic Valves for the Heart**

Children may be born with holes in the wall which divides the two auricles of the heart. By means of nylon and lucite buttons such holes now can be permanently closed. The buttons are made in halves and fit together like a snaphook. The button used must be slightly larger than the hole which is to be closed. A special instrument is employed to push one half of the button through the hole. It is then pulled back in order that the teeth on its side catch in the septum. The other half of the button is then attached.

Many people have an aortic valve which does not close, resulting in aortic regurgitation. This can be remedied by means of a plastic ball which is attached by means of nylon rings to the aorta. As the heart pumps the blood into the aorta the ball moves forward and the blood passes through. However, if the blood starts to regurgitate into the heart the ball moves backward and blocks the opening.

In cases of aneurysm where there is danger of the aorta rupturing, plastic film may be wrapped around the weak spot. This irritates the vessel wall, resulting in scarring and thickening.

**Cartrids**

A new type of ampul has been made available. It consists of a glass cylinder fitted with a rubber diaphragm at each end. A metal threaded attachment for a plunger is inserted in one end. The medication contained in it is administered by the use of a metal syringe which can be used over and over. Special needles are supplied. However, an adapter is available which makes the use of standard needles possible. This type of medication is highly convenient for use by physicians or nurses in the home of a patient. Sterile technique must be observed, but cleaning of syringes and needles is eliminated. Where sterilization of needles is no problem, as in the hospital or physician's office, the adapter for standard needles may be employed conveniently. It is instantly ready for use and provides accurate dosage. The permanent metal syringe is both dependable and economical.

Eli Lilly and Co. have marketed this special ampul under the name Cartrid and the following medications are available: Duracillin A.S. and dihydrostreptomycin sulfate.

**Checkwell**

A unique device for dispensing measured doses of medicaments has been developed. Made of polyethylene it consists of a reservoir, or well, joined to a length of tubing. The well is force-fitted into the neck of the plastic bottle. Fingertip pressure on the walls of the bottle forces the liquid up the tube into the well, making it accessible for use without exposing the main supply to contamination.

If exact measuring of a liquid is desired, this device can be graduated to assure precise doses according to prescription instructions.

In addition to serving as a dispenser, the new unit can be designed as an eyecup or nasal dropper, as a shallow or deep dish, as receptacle for storing hypodermic needle in a sterile solution, or as a miniature bowl for mixing the contents of the bottle with some other ingredient.

The dispenser-bottle combination is virtually indestructible. It can be dropped or bashed without shattering.

This device can be used for prescriptions, for laboratory chemicals, as a topical dispenser, for dental drugs, label moistener, storage unit for syringe needles and in many other ways.

Known as the Checkwell it is manufactured by Plax Corporation.

**Drainaway Vials**

Silicone treated vials are now being used for parenteral penicillin products. Because the vial drains freely the dosage is complete, and waste is cut down considerably. The vials are covered by patent No. 2,504,482 held by Dow Chemical Company and Premo Pharmaceutical Laboratories. Other firms are using them on a royalty basis.

**Dynafit Syringe**

A new syringe has been developed which differs from ground-glass hypodermic syringes now in use in that it has an unground barrel. Until now, the plunger and barrel of a hypodermic syringe have been fitted by grinding the external surface of the plunger and the inside surface of the barrel. Although the ground-glass surfaces look smooth to the naked eye, actually they are rough and pitted, as may be seen under a microscope. As the syringe is used, the two ground-glass surfaces rub against each other and the friction grad-

ually wears each surface down until the syringe "back-flows" and must be discarded as worn out.

Grinding the inner surface of a syringe barrel removes the "skin" of the glass and exposes the "pores" to erosion during sterilization procedures. Removal of the "skin" by grinding also lessens the inherent resistance of the glass to breakage. The unground barrel of the new syringe largely eliminates these factors which cause ground-glass hypodermic syringes to wear out. The finely-ground plunger slides easily along the unground, smooth inner surface of the barrel and friction is reduced to a minimum. Since the "skin" of the glass has not been removed by grinding, the barrel is more resistant to erosion and breakage.

This new syringe is being marketed as Dynafit Syringe by Becton, Dickinson and Company.

**Heart and Lung Machine**

A stainless steel heart and lung machine has been developed which may save many lives. When the patient's heart stops beating during surgery the machine is connected to the body, and it simulates the action of the heart and lungs. When more machines are available they will probably be a part of all emergency equipment. The machine consists of a Vanton pump which acts as the heart and an oxygenator which substitutes for the lungs. The entire unit is compact, transparent and mobile. It measures 30 inches high, 16 inches wide and 18 inches deep.

When the heart-lung machine is attached to the body the blood is detoured and flows by gravity through the stainless steel cylinder where it gives up its carbon dioxide to a maze of stainless steel mesh. Oxygen flowing up from the bottom is absorbed, and the blood flows on to the pump where it is gently pumped back into a main artery of the body. This machine has been produced by J. J. Ashton and Co.

**Mechanical Nose**

A new machine known as a mechanical nose has been developed to detect a nerve gas attack or hazardous industrial fumes. It is more sensitive than the human nose and can measure odors and gases in concentrations of less than one-hundredth part in 1,000,000 parts of air. Such sensitivity is necessary because a minute amount of an atmospheric contaminant can seriously affect a wide area.

The mechanical nose works on the same principle as a military gas mask, with a huge air-collecting blower attached. The motor-driven blower sucks in large volumes of air and forces 40 cubic feet a minute through carbon-filled canisters. As in a gas mask, the carbon absorbs the polluting materials, which can then be removed, analyzed and measured.

**Color Translating Ultraviolet Microscope**

An ultraviolet microscope which combines the properties of a microscope and a camera to photograph chemically treated tissue specimens has been demonstrated. Cells differing chemically from each other also differ in color under this microscope. It is housed in a boxlike metal shell six feet tall. In the center of one side is a circular viewing screen, some seven inches in diameter. Three pictures of each specimen are taken. The machine automatically develops and dries the film, and projects the pictures over one another on the viewing screen through ordinary color filters. In one test most of the cancerous cells appeared green, but one group was orange which might indicate a different chemical structure. This has never been demonstrated so markedly before. The machine was developed by the Polaroid Corporation.

**Unimatic Syringe**

There has been made available a new ready-to-use disposable syringe which makes the administration of injections much easier. The syringe is filled with the medication by the manufacturer. When ready to administer it the physician removes the needle guard and inserts it into the opposite end as a plunger, presses the plunger until the needle pierces the cartridge, aspirates and makes the injection. This unit is useful in emergencies and in house calls; as a time-saver for physician and patient in office visits; and in hospitals as an economy measure to defeat excessive costs of needle and syringe breakage and loss and of expensive sterilization procedures. At present this disposable syringe is marketed containing 300,000 units of procaine penicillin G in stable aqueous suspension. It is known as the Crysticillin Suspension Unimatic Syringe and is available from E. R. Squibb and Sons. It can be carried in the physician's bag for a week without significant loss of potency.

### X-Ray Chair

One of the difficulties in X-ray therapy of deep-seated tumors is the effect of the radiation on surrounding normal tissues. Now there has been developed a rotating chair which is being tried experimentally. It is hoped that the chair will make it possible to aim the X-ray beam more accurately, decrease the radiation dose inevitably received by normal tissue, lessen the untoward side effects of radiation and make possible the delivery of higher doses of destructive X-radiation to a tumor. The chair and body turn on a central rotational axis which is the tumor, thus the X-ray is always directed on it. This new chair is built so that it can be rotated at any speed in a complete circle and can be oscillated at any given arc or reciprocate.

## NEW TECHNICS

### Administration Through Plastic Tube

Circulation is stopped in an area served by a blood vessel when a thrombus forms. These clots can be removed, particularly in the vessels of the arms and legs. In order to prevent new clot formation during the operation anticoagulants are often used. However, there is always a danger of hemorrhage. In order to avoid this it was thought desirable to administer the anticoagulant to specific areas. This is done by the insertion of a thin plastic tube in the artery near the clot and the anticoagulant is administered through the tube during and after the operation.

### Carbon Dioxide Therapy of Nervous Disorders

Various nervous disorders especially linked with emotional upsets have been difficult to treat properly. Included in this group are alcoholics, stutterers, asthmatics and those with allergic dermatoses. Recently it has been reported that effective therapy with a special carbon dioxide mixture can be achieved 86 percent of the time. The mixture is composed of 70 percent oxygen and 30 percent carbon dioxide and is administered by inhalation just as an anesthetic is.

One case treated thus was an alcoholic who had been an invalid for many years. After 34 treatments he abstained from liquor for four months, the longest period over a span of 15 years. Sixteen treatments were effective in making a woman see and walk after being hysterically blind for eight years. However, the gas mixture was in-

effective in the very serious depression cases which were of deeper origin and had lasted longer.

It is not definitely clear as to how this mixture of oxygen and carbon dioxide accomplishes these results. It has been theorized that the body tries to maintain its stability by natural means. Consequently, when it is thrown off balance the nervous system is influenced. The gas inhalations, therefore, appear to restore the body balance by altering the direction of the nervous stimulation.

Some patients have reported no relapse for five years, but further investigation is necessary to determine the long-range results.

**Films for Radiation Equipment**

In order to protect nurses and other workers in cancer clinics against radium rays one clinic has made all their workers who handle radium wear a strip of a specially treated film at their waists. Nurses who handle the needles and are, therefore, more exposed are required to wear a strip around the wrist as well. At the end of each week the film is returned to the laboratory for examination. Nurses are only permitted to handle radium for two months and then they are given a four month respite from this work.

**Heart Study**

A new technic has been developed which facilitates more complete studies of the heart and its diseases. By means of a silk catheter inserted into the veins of the arm and following through to the coronary vessels of the heart, it is possible to determine what happens in various heart diseases; how much oxygen is used; how efficiently the heart could operate; and how much blood is flowing through the heart.

**Kahn Blood Test**

A new blood test has been developed which shows promise of providing a means whereby a disease can be detected before clinical symptoms are evident. The new Kahn test also can be used to measure the effectiveness of various methods of therapy.

Whenever the normal antibodies in the bloodstream are needed to combat disease organisms they increase in number. It is suggested that the numerical increase varies with the disease. Consequently, a study of the number of antibodies present should serve as an indicator. As cells die normally their contents are released. The fat-like

substances known as lipids have been found to lead to antibody production. Thus in healthy individuals the antibody output should be constant and can be tested by a series of precipitation tests. With the onset of disease this changes so that more cells are destroyed, more lipids released and more antibodies present. It is known as the "universal reaction" pattern. Thus far distinctive patterns have been developed for syphilis, yaws and lepromatous leprosy. Studies also have been made in malaria and tuberculosis. Although the present laboratory procedure is much too complicated for general use it is hoped that further research will simplify it.

### Mosquitoes for Bio-Assay Tests

Some use has been found for the mosquito. The larvae are employed in a bio-assay to determine the quantity of residual toxic material on fruits and vegetables. The larvae are very sensitive to sprays and with their use as little as less than one part of the toxic substance in 10,000,000 parts of vegetable can be detected. The assay applies only if the insecticide is known, because of the difference in reaction patterns of various kinds.

### Surgery in Epilepsy

Epileptics frequently suffer from fitful nightmares. Recently an operation which removes a portion of tissue from the base of the brain has resulted in the establishment of normal mental processes. It is employed especially in idiopathic epileptics who are usually subject to amnesia. In some cases the operation also eliminates severe epileptic attacks although it is not aimed at this.

## PEPTIC ULCER

### Prantal

A new quaternary ammonium (piperidylidene) derivative has been shown to possess value in peptic ulcer therapy. Chemically it is N, N-dimethyl-4-piperidylidene-1, 1-diphenylmethane methylsulfate. This compound is soluble in water (50 mg./cc.), methanol, ethanol, and chloroform, but insoluble in benzene and petroleum ether. The desirable action may be derived from its structural dissimilarity to the parasympathetic mediator, acetylcholine, or the autonomic blocking agent, atropine. Most synthetic compounds having analogous

structural components to acetylcholine (the characteristic ester linkage, etc.) are much less selective in their parasympatholytic activity.

After extensive animal experiments this compound has been studied and evaluated in human beings with roentgenologically diagnosed peptic ulcer. It may provide prompt relief from pain, diminshed overnight secretions, diminished free hydrochloric acid, diminished total hydrochloric acid, and reduced gastric and small bowel motility. It provides a treatment adjunct in man without toxicity; side actions, particularly mydriasis, cycloplegia, dryness of the mounth, urinary retention or oliguria, and constipation are seldom encountered.

The parasympathetic blocking and antisecretory actions of diphenmethanil methylsulfate have been utilized in a number of other diseases. Improvement has been noted in hyperhidrosis, dyshidrosis, contact and friction dermatitis, spastic disease of the gastrointestinal tract (pylorospasm, gastroenteritis, spastic and ulcerative colitis), and miliaria. Further investigations of this compound are being carried on to determine its usefulness in other conditions by Schering Corporation, under the tradename Prantal.

## POLIOMYELITIS

### New Blood Fraction Therapy

A new blood fraction is now being tested in the prevention of paralysis from poliomyelitis. A county in Utah has been selected for this purpose because it was reaching the peak of an epidemic. The blood fraction used is gamma globulin and although it will not prevent poliomyelitis in its usual form, the mild infection, it may prevent paralysis.

### Cocksackie Virus

The Cocksackie virus causes a disease similar to that of poliomyelitis but without the crippling effects. The disease is very common around the world and frequently is confused with poliomyelitis. Research is now being directed toward learning how the virus may be related to poliomyelitis.

### New Concept

Animal experiments conducted recently have shown that susceptibility to poliomyelitis is related directly to the efficient functioning of the glands. The reason, therefore, for some children contracting polio whereas others who are equally exposed do not is

obvious. This frequently occurs in a family where there are several children.

Women of similar ages can be separated into two groups. Those who are pregnant are much more susceptible to polio than those who are not. In pregnancy the production of cortisone by the adrenals is increased and, therefore, it was suspected that cortisone was responsible for the susceptibility to polio.

Hamsters have rarely shown any response to inoculation with polio virus, or if they did the disease was mild and amongst those which developed it the mortality rate was low. However, when first given cortisone followed by the virus they became paralyzed within two to six days, and the mortality rate was 100 percent.

Tests with ACTH revealed no effect even in spite of the fact that ACTH is the pituitary hormone which stimulates the adrenal gland to produce cortisone. However, the cortex of the adrenal gland secretes in addition to cortisone more than 25 other hormones whose activity is unknown. Thus the conclusion is reached that some one or more of the other hormones produced as a result of stimulation by it equalizes its effect or reverses the effect of cortisone. Based on the animal experiments it can be assumed that there is a relationship between adrenocortical function and susceptibility to experimental poliomyelitis on the part of the Swiss mice and hamsters.

Physical exercise is known to stimulate the adrenal gland to produce more cortisone. Fatigue due to over-exercise by children increases the child's susceptibility to polio. Consequently, there appears to be a definite relationship.

After tonsillectomy and other surgical operations and during other periods of stress there is an increased secretion of cortisone. It is at such times that there also exists a greater susceptibility to poliomyelitis. Because there appears to be a direct relationship, therefore, between the adrenal glands and poliomyelitis and other infectious diseases caution must be exercised in giving cortisone in arthritis and other conditions in which it has been found effective.

## RADIOACTIVE COMPOUNDS

### Diiodofluorescein

Radioactive diiodofluorescein has been found of value in detecting and localizing brain and spinal cord tumors. This dye has an affinity

for tumor tissue and the more malignant the tumor is the more dye is absorbed. By scanning the skull or spine with a Geiger-Müller counter the radioactive concentration is readily located. In 500 patients accurate diagnosis has been achieved in 95.5 percent.

### Gallium and Gold

Gallium is one of the rare metallic elements which remains a liquid at very low and very high temperatures. Radiogallium has been studied for its toxicity. During the test it was observed that it became concentrated in growing bone. As a result it is now being tested for its effect on the usually radioresistant primary and metastatic tumors of the bone.

Although no definite conclusion can be reached as yet, some promise of palliation has been observed. Even though this radiogallium may never be used therapeutically it may lead to a better understanding of tumor metabolism and may direct research towards more effective means of therapy. It is administered intravenously.

Another radioactive compound being used clinically is gold. It can be prepared in a colloid form which is chemically inert. It may be injected directly into the tumor such as in cervical cancer where it is believed that it is transported selectively to the adjacent lymph nodes, thus destroying early metastases. In terminal ovarian cancer it decreases the quantity, or even stops the flow of ascites from the abdomen. When administered intravenously the radiogold concentrates in the liver and spleen. It is believed that the particles are picked up by the tissues so that it may be of value in lesions in these tissues. Just as with radiosodium, radiogold may possibly show value when prepared as a salt, dissolved and placed in a bag within the uterine cavity.

## TOOTH DECAY

### Fluorine

The action of fluorine in preventing tooth decay now appears to depend upon the locality. Too much magnesium in the fluorine-treated water or in other foods and liquids blocks the action of the fluorine. However, addition of small quantities of phosphorus to the diet may block the effect of the magnesium.

## VASOCONSTRICTOR

### Levophed

A synthetically produced hormone of the adrenal meduila has been found in clinical trial to prevent fatalities that might otherwise occur due to lowered blood pressure. Chemically it is nor-adrenalin and when administered to shock patients who failed to respond to blood plasma alone it caused improvement. Drugs hitherto available have either not been completely effective or have had disturbing side effects. Because it is so potent it must be used with great care and only under experienced, expert direction. Known as Levophed this compound is available from Winthrop-Stearns, Inc.

## VITAMINS

### Citrovorum Factor

A new vitamin, tentatively called the citrovorum factor, has been found to accelerate growth. In a search for a method of analyzing amino acids a bacterium, *Leuconostoc citrovorum,* was used. It was found that this organism required not only amino acids but liver extracts to grow. Thus began the analysis of liver extracts. It was found that two liver extract vitamins stimulate bacterial growth. One was folic acid and the other was a new vitamin. Further tests revealed that folic acid must be converted into the citrovorum factor before animal cells can make use of it. Therefore, these two appear to be related. In animals the citrovorum factor appears to have some effect in leukemia so that further research in this direction is being done.

### Folic Acid Potentiation of Vitamin $B_{12}$

In chicks made anemic by a deficient diet, folic acid appeared to be the most active vitamin $B_{12}$ potentiator. The chicks fed vitamin $B_{12}$ and folic acid in 14 days showed a return to normal of red cell counts and hemoglobin levels. The same effect was not observed with iron, thymine, duodenal substance and desiccated stomach. This is being investigated further by the Nion Corporation.

### Synthetic Vitamin A

Vitamin A has now been synthesized and stabilized by coating the crystals with gelatin. Thus treated it does not deteriorate when exposed to air at high temperature for 1,200 hours, the approximate

equivalent of storage for three years under normal conditions. This has been accomplished by Chas. Pfizer and Co., Inc.

### Tobacco as Source

Tobacco has been shown to contain four members of the B vitamin group: thiamine, nicotinic acid, riboflavin and pantothenic acid. Although some of these vitamins are absorbed by inhalation when smoking, the quantity is not sufficient to do very much good. The vitamins were discovered during a complete analysis of tobacco. Thus far 50 chemicals have been isolated from tobacco and there are believed to be more present.

## MISCELLANY

### Anisatin

Anisatin has been extracted from the fruit of the Japanese star anise. Although it is a very toxic substance it may have value as a heart stimulant. It is colorless and crystalline and very toxic. Death is due to respiratory arrest during a convulsive seizure.

### Arobon

Diarrhea and other gastrointestinal disturbances in infants, children and adults are often difficult to control. A specially prepared carob flour has been found to be particularly effective. It has a rapid antidiarrheal action and supplies 71 calories per ounce.

Pectin, lignin and hemicellulose, constituting 22 percent by weight of the powder, effectively absorb bacteria and toxins. These complex organic compounds form a bulky, bland and smooth mass through absorption of water, thereby exerting a valuable demulcent action. It has no toxic or adverse side reactions.

Carob flour, specially prepared is marketed as Arobon by the Nestle Company.

### Beta-propiolactone

Beta-propiolactone is manufactured from formaldehyde and acetone or acetic acid, all of which are basic petroleum or coal products. Its derivatives are being used for the synthesis of blood plasma substitutes, for home hair waves, and for synthesis in the field of plasticizers for vinyl resins. Beta-propiolactone itself has proven effective in killing viruses in whole blood and blood plasma. It is believed to

react chemically with the virus. The derivative of this chemical also has another unusual use in that when applied to swamp land the land could be quickly surfaced into roads and air strips.

Beta-alanine, an intermediate in the synthesis of calcium pantothenate, is a derivative of beta-propiolactone which is being investigated at the B. F. Goodrich Research Center.

**Catalase**

Catalase, an enzyme, has been shown to be the factor which is responsible for retarding the growth of bacteria after they have reached a maximum concentration. Catalase is produced by the bacteria and it in turn when produced in sufficient quantity may inhibit their growth. It is believed, too, that virulence can be explained in a similar manner because higher concentrations of catalase are necessary for inactivation of virulent strains than for avirulent types. A virulent strain of the tubercle bacillus showed a much lower catalase production than did a corresponding variant which was less virulent but produced more catalase.

Human blood contains less catalase than does that of guinea pigs, rabbits, and monkeys all of which are less susceptible to infection than are humans. Thus, further work is being done toward the possible use of catalase in therapy. The juice of the banana plant contains considerable catalase in crystalline form.

**Compound XXIV**

The use of histamine in routine clinical testing for achlorhydria is limited because of the undesirable side reactions. Recently an analog of histamine has been found to stimulate gastric acid secretion without causing any other pharmacological actions of histamine. Chemically this compound is 3-(β-ethylamine) pyrazole. It is also known as compound XXIV.

This compound is an isomer of histamine with a pyrazole configuration instead of an imidazole one in the ring. In the first studies of this synthetic it was found that no contraction of the isolated guinea pig ileum occurred nor was the blood pressure lowered in cats. In dogs compound XXIV is only 1/700th as potent as histamine in depressing the blood pressure.

When compound XXIV as the hydrochloride was given subcutaneously and intramuscularly in doses of 10-50 mg. to 20 human

beings no characteristic side effects of histamine such as the triple response at the site of injection, headache or flush were observed. A greater output of HCl results from the 50 mg. dose than from 0.1 mg./Kg. of histamine diphosphate. Side effects similar to those caused by histamine occur following doses of 100 mg.

Compound XXIV should be useful not only in testing for achlorhydria because of its lack of other histamine effects but also because it stimulates more strongly acid secretions. This should be of value in borderline cases. It is possible too that it may prove of value in determining the maximal secretory capacity of the human stomach in health and disease.

**Dihydroergocornine, Dihydrocystine and Dihydrokryttine in Migraine**

Migraine is very difficult to treat. The currently available drugs are effective in some individuals while in others they have little effect. Recently dihydroergocornine (DHO), dihydrocrystine and dihydrokryttine in equal amounts by weight have shown promise in preventing migraine in 50 percent of the patients given the drugs. The combination is known as CCK.

**Dormison**

The alcohol, 3-methyl-pentyne-ol-3 has been found to have a hypnotic action. It readily induces a calm, peaceful sleep, and the patient experiences no heavy, depressive feeling upon awakening. Quite unlike most sedative hypnotics presently used in clinical medicine, it contains no nitrogen, urea residues, sulfone groups or bromine. It has a low order of toxicity, is rapidly metabolized in the human body and leaves no after-effects.

This new drug is recommended for adult patients with simple insomnia. Sleep is usually induced in 5 to 30 minutes with one or two 250 mg. capsules. As the effects of the drug last only one or two hours, the drug may be considered as one to assist or accelerate the process of going to sleep. The drug does not have prolonged suppressive action which is reflected in the lack of "drug hangover" when the patient awakens. Due to its rapid metabolism, it is not recommended in those patients with insomnia where severe pain or agitated psychotic states coexist.

Animal experiments showing that this drug has a potentiating effect on sodium pentobarbital also revealed that not only are the hypnotic and anesthetic effects of the barbiturate increased, but the general depressant action on respiration is also accelerated. The intensity of the potentiation is variable and is dependent on the absolute and relative doses of the two agents when given simultaneously. Until such time as extensive data are available on the synergistic effect of this drug on barbiturates in man, barbiturates should not be given to patients receiving this new compound.

Known as Dormison this compound is marketed by Schering Corporation.

**Hemophilia in Women**

It has always been reported that only men could have hemophilia and that it was transmitted by women. However, three cases of this disease in women have now been reported. Inheritance of the disease by a woman can occur only when a man with hemophilia married a woman-carrier of the disease.

**Jarrell Blood Factor**

A new blood factor, called the "Jarrell" or "J" factor, is one of three new blood factors recently announced. It is named after the patient because her case led to the discovery. While the "J" factor is a dominant hereditary factor and present in blood of all individuals examined, it was not found in this patient's blood. She does have an antibody (immunity agent) to the Jarrell factor which makes her blood incompatible with blood from the other tested donors.

A study of the history revealed no possibility other than that the patient's cancerous growth was the source of the antibody to the Jarrell factor. Tests showed that cells from the cancer could absorb or remove the Jarrell antibody from the patient's blood serum, but not other antibodies. It was suggested, therefore, that the "J" factor in the tumor arose from the mutation of the genes, and that this mutation caused both the tumor and the blood "J" factor it was found to contain.

The fact that the blood factor is normally present in the majority of people tested so far indicates that the blood factor, itself, is not the cause of cancer. However, because of its presence only in the

cancer mass of the Jarrell patient and its absence in her blood, it lends evidence to the belief that it is the result of mutation of hereditary genes of the person which cause the onset of a malignant growth. Mutation of any one of the many thousands of genes which are normally present in the body could be the start of cancer.

**Pyromen**

A sterile, nonprotein and nonanaphylactogenic bacterial component for the therapy of allergic conditions has been developed as a stable, colloidal dispersion for parenteral use. Its preparation involves a chemical fractionation that removes protein and other cellular elements. The active factor appears to be a complex polysaccharide.

There is a manifold response characterized by marked activation of the reticulo-endothelial system, increased granulocytic hematopoiesis, moderate lymphoid hyperplasia, stimulation of the adrenal cortex and, when given in sufficient dosage, elevation of the body temperature.

This product is indicated in the symptomatic control of such allergic disorders as asthma, hay fever, atopic dermatitis, urticaria, penicillin reactions with acute angioedema and urticaria, gastrointestinal allergy and fatigue syndrome of allergic origin. Coincident relief of dysmenorrhea has occurred in a number of these patients. Subjective and objective improvement usually occur within two weeks; occasionally, three to four weeks are required. A few patients may need this therapy for long periods of time. It also is indicated in the treatment of neurodermatitis, psoriasis, seborrheic dermatitis, acne in adults, pityriasis rubra pilaris, eczema and infantile eczema. Iridodyclitis, keratitis, uveitis, iritis and corneal ulcer have responded well to it. Most patients respond to five to ten gamma doses, injected two to three times weekly. A few patients have required larger doses.

Known as Pyromen this product is marketed by Travenol Laboratories.

**Nutri-discs**

Nutrient buffered, vaginal douche tablets designed to prolong and enhance sperm viability and motility, thus providing an adjunct

to the treatment of infertility have been developed. Chemically it is Baker-glucose salts with small amounts of egg albumen which serves as a protective colloid buffer for the prevention of pH shock and, therefore, helps to prevent settling or clumping of the sperm cells. Sperm motility and survival are deleteriously affected by acid. Since lactic acid is a product of sperm metabolism and since sperm are deposited in the acid vagina, buffers such as egg albumen, phosphates and buffer systems which tend to keep the medium alkaline are of considerable importance. These discs contain traces of manganese chloride which is believed to be a catalyst for sperm metabolism. One disc dissolved in 4 ounces of water provides a buffered isotonic nutrient solution.

It is contraindicated in patients with a history of allergy to egg albumen and who show a strong positive reaction to a patch test.

Under the name of Nutri-discs this product is available from Ortho Pharmaceutical Corporation.

**Perparin, Diquinol**

An ethyl analog of papaverine, ethaverine, is being studied for its effect in coronary disease. Chemically it is 6,7-diethoxy-1-(3,4-diethoxy-benzyl isoquinoline). Claims have been made that it is two to four times as potent a spasmolytic agent as the parent drug. When compared with papaverine it was found to have both a more gradual and a more persistently effective action at suprathreshold dosage. Because of this more durable action it should be more effective in total effect over a period of time. Ethaverine is also known as Perparin and is being studied by Parke, Davis and Company under the tradename of Diquinol.

**Preceptin**

A new contraceptive jelly has been developed which does not require the use of a diaphragm. The active ingredients are *p*-diisobutylphenoxypolyethoxyethanol 1 percent and ricinoleic acid 1.17 percent in a synthetic gel base buffered at a pH of 4.5. The base adheres well to the moist mucosal surface of the cervix, is more miscible with semen, and allows rapid release of the active spermicides. Known as Preceptin this product is marketed by Ortho Pharmaceutical Corporation.

**Quinidine**

Quinidine has been given by the oral route of administration for many years, but only recently has it been made available for parenteral administration. It has been found that propylene glycol is a satisfactory vehicle for quinidine sulfate and that the finished solution can be administered parenterally. The need for such a preparation has been great in cases where the oral administration gives rise to diarrhea or other gastrointestinal symptoms; the patient is in coma; and for the prevention and treatment of disorders of heart rhythm during surgery and anesthesia. It is also indicated in pre-operative preparation of the surgical patient in order to prevent auricular and/or ventricular fibrillation during anesthesia; in young patients exhibiting little cardiac damage and in those in whom the arrhythmia is of recent origin; cases of auricular fibrillation after thyroidectomy; and patients whose disorder causes intractable palpitation and whose chief complaint is a "pounding heart." It is administered intramuscularly.

Quinidine sulfate ampuls containing 3 gr. per cc. in propylene glycol are available from Marvin R. Thompson, Inc.

For intramuscular or intravenous administration quinidine gluconate is available. It is a white dextro-rotatory salt having a molecular weight of 520.55. It is 62.3 percent anhydrous quinidine and 37.7 percent gluconic acid. It is indicated (1) when the patient cannot take medication by mouth because of vomiting or unconsciousness and (2) when, in the presence of very rapid heart action—especially ventricular tachycardia—it is imperative that the therapeutic effect of the quinidine be obtained as quickly as possible. Marked palpitation, dyspnea, vomiting and a shocklike state in patients with ventricular tachycardia are signs that the intravenous administration of quinidine may be required as a lifesaving measure. If the patient's condition is not critical it may be given intramuscularly, but when it is critical, intravenous administration is indicated. Quinidine gluconate is available in ampuls containing 0.8 Gm. of the alkaloidal salt in 10 cc. of Water for Injection, U. S. P. This quantity of quinidine gluconate represents 0.5 Gm. of anhydrous quinidine.

**Sequestrene**

Research studies are constantly being directed toward the ideal solvent for urinary calculi. Use of ethylenediamine tetra-acetic acid

has been reported as more effective than any thus far made available. It also acts with maximum efficiency at a neutral pH compared to the acid pH of Suby's solution. However, it was found to cause some irritation when used to irrigate the bladder. It is not as yet known whether this is due to the removal of the calcium ion or to impurities in the product.

Alrose Chemical Company is studying this chemical under the name of Sequestrene.

**Silicote**

An effective skin protective agent against water in cases of dermatologic infection and irritation has been developed. It consists of 30 percent silicone oils in petrolatum bases. It is applied in a thin coat every four to eight hours. Previous coats are not removed. Satisfactory results were obtained in 72 hours. Known as Silicote this product was developed by the Silicote Corporation.

**Sodium Retention Resins**

The theory of ion exchange was first applied to the demineralization of water. More recently the use of certain resins in treating gastric hyperacidity and peptic ulcer was introduced and several products are now available for this purpose.

Now the ion-exchange resins are being used in the management of congestive heart failure, hypertension, cirrhosis or wherever a "salt-free" or low sodium diet is indicated. For this new use a new plastic resin powder has been developed which is related in composition to Bakelite, Plexiglas, styrene and nylon. Chemically, it is a cation exchange resin of the carboxylic type. The resin is insoluble, nontoxic, nonabsorbable and nonirritating. It is prepared in a fine particle size so as to provide more surface area.

There is an active interchange of electrolytes across the wall of the normal intestine. Sodium, potassium and calcium are secreted into the lumen of the intestines and then reabsorbed. This cationic resin binds a portion of the sodium and prevents it from being reabsorbed. Potassium balance is maintained by having some of the resin in the potassium cycle. The hydrochloric acid in the stomach causes the resin to release potassium ions and bind hydrogen ions in exchange. These potassium ions combine with chloride and compensate for those which may be removed when the resin reaches the

intestinal tract. In the less acid medium of the intestine another ion exchange occurs. Hydrogen ions are released and the cations are attracted and bound by the resin and then carried out in the feces. Thus the ion chiefly removed is sodium. Calcium content is not altered to any significant extent, and potassium balance is maintained.

The contraindictions for these resins include chronic renal lesions which interfere with normal sodium exchange or with ammonia formation.

There are several variations of these sodium removing resins available. Carbo-Resin, marketed by Eli Lilly Co., contains 12 percent alkylene polyamine resin (anion exchange resin) and 29 percent potassium salt of carboxylic acid resin (cation) and 59 percent carboxylic acid resin (hydrogen cycle) (cation exchange).

Natrinil, marketed by National Drug Co., contains 20 percent in the potassium cycle and 80 percent in the hydrogen.

Resodec, marketed by Smith, Kline and French Laboratories, is a polycarboxylic cation exchange resin, part of which is in the potassium cycle and the balance in the ammonium cycle.

**Solu-Plastin**

A new improved stable thromboplastin solution has been developed for the determination of prothrombin time. It eliminates the need for the time-consuming manipulations previously necessary to prepare thromboplastin powder for use. It also yields rapid, accurate, consistent and reproducible prothrombin times. It should prove to be economical to the many hospitals and clinics which are making an increasing number of prothrombin determinations every week as this test becomes more commonplace. It is efficient in conjunction with the newer anticoagulants, which depend on frequent, accurate testing of the prothrombin time. Only the actual amount needed is used, so that there is no waste. The remaining portion is stable indefinitely at 4°C, and it retains full activity for about two weeks at normal room temperature. Each package is accompanied by a bottle of 0.0125 molar calcium chloride solution, the optimal concentration. It is available from Schieffelin and Co.

**Simplastin**

Another prothrombin time testing reagent which requires simply the addition of distilled water to be made ready for use has been de-

veloped. With the test it can be performed in 15 minutes, thus saving many hours of hospital staff time. It was developed by Chilcott Laboratories and has been given the name Simplastin.

**Tolanate**

In previous review articles the effect of inositol has been reported. Its hexanitrate now has been made available. This compound is a long-acting hypotensive agent and has been found effective in the management of essential hypertension, particularly in emotional hypertension and the hypertension of the menopause. Its use has been shown to be accompanied by a low incidence of so-called nitrite headache, a distinct advantage, particularly for those patients who cannot tolerate other organic nitrates.

Known as Tolanate this product is marketed by C.S.C. Pharmaceuticals. Tolanate with Phenobarbital is also available, each tablet containing ten mg. of inositol hexanitrate and 16 mg. (¼ gr.) of phenobarbital.

**Varidase**

A physiological curette recently was made available. Each vial contains, in desiccated form, a minimum of 100,000 units of streptokinase (SK) and 25,000 units of streptodornase (SD). These substances are elaborated by Group C hemolytic streptococci and excreted by these organisms into the culture medium. The substances are separated from bacteria, purified, filtered, frozen and dried.

Streptokinase is an enzyme activator of a precursor of a fibrinolytic factor in human serum.

Streptodornase is an enzyme which catalyzes the breakdown of desoxyribonucleoprotein.

The combination is indicated in many situations—especially in the thorax and soft tissues—where clotted blood and fibrinous or purulent accumulations are undesirably present following trauma or inflammation. It serves as a tool for removal of coagula and purulent exudates, and thereby facilitates action of antimicrobial forces (both humoral and antibiotic) and hastens the normal processes of repair.

The clinical value of the curette has been established for treatment of: hemothorax and hematoma (post-operative or traumatic); empyema (post-pneumonic, loculated, bacterial, or selected types of tuberculous); chronic suppurations (draining sinuses, osteomyelitis,

infected wounds or ulcers, suppurative tuberculous adenitis, sinusitis, otitis media, and suppurative arthritis). As an adjunct to surgical intervention, it offers a promising field in the care of chronic suppurations, for it defines problems not previously possible, it makes subsequent surgical procedures effective, and it facilitates primary closure. The use of the curette is being investigated for the treatment of infected burns, lung abscess, fibrinous bronchiolitis, unresolved pneumonia, meningitis, pericarditis, other fibrinous or purulent exudates, and for the prevention of post-operative adhesions.

There are certain limitations. It cannot act upon fibrous tissues, mucoproteins or collagen, and, therefore, is less efficacious if a hemorrhagic or pyogenic exudate is chronic to the extent that fibrous scar tissue has produced irreversible damages. It is of no value in the treatment of recent, noninfected burns and should not be used in acute cellulitis or inflammations unless suppuration is present or the thickness of a purulent exudate (or loculations) prevents proper drainage or interferes with action of antibiotics.

It is contraindicated in the presence of active hemorrhage or acute cellulitis without suppuration.

Lederle Laboratories Division, American Cyanamid Co., are marketing this physiological curette as Varidase.

**Zirconium Carbonate**

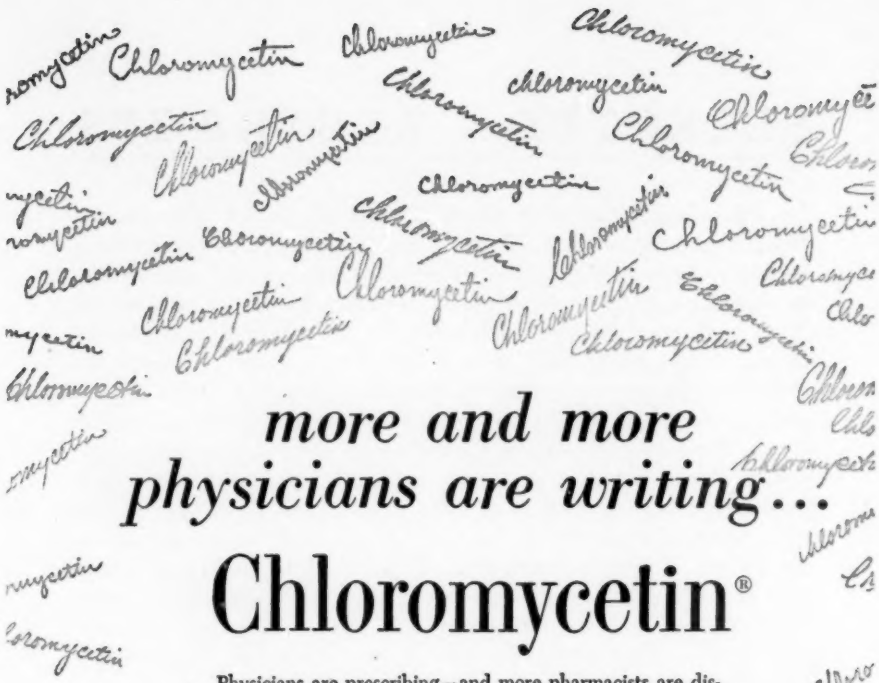
Zirconium carbonate has been used industrially in various ways, but only recently was it demonstrated to possess therapeutic possibilities. Used in 25 percent concentration in ointment form it has been found effective in approximately 90 percent of cases of poison ivy. It appears to neutralize the excess irritant, urushiol, on the skin. It acts not only early in the condition but also later. This ointment also shows promise in the therapy of poison oak, athletes' foot and certain industrial dermatitic conditions. It is manufactured by Vitanum Alloy Manufacturing Co., Division of National Lead Co.

# SELECTED ABSTRACTS

**Nitrofuran Chewing Gum in Dental Caries Prevention.** Dreizen, S. and Spies, T. D. *J. Am. Dent. Assoc. 43:*147 (1951). Eighty volunteers, each having evidence of active dental caries, were selected for a study of the effect of nitrofuran (5-nitro-2-furaldehyde 2 (2 hydroxyethyl) semicarbazone) in the prevention of dental caries. The subjects were divided into three groups. Group 1 included 30 persons each of whom chewed 1 stick of a specially prepared gum within 4 minutes and for 10 minutes after each meal. Group 2 included 25 persons each of whom chewed one stick of the specially prepared gum, but not containing nitrofuran, after each meal. Group 3 included 25 persons who did not chew any type of gum routinely after meals. No attempt was made to change any of the dietary or oral hygiene habits of any of the subjects during the year of study. The chewing gum contained 7 to 7.5 mg. of nitrofuran in a base composed of chicle gum base 38.3 per cent, sorbitol 53.3 per cent, mannitol 5 per cent, peppermint flavor 1.3 per cent, and softeners (paraffin wax and lecithin from soybeans) 1.1 per cent.

During the 12 month experimental period the subjects in Group 1 developed 25 new carious lesions as contrasted with 82 new lesions in Group 2 and 105 new lesions in Group 3. The dental caries attack rate in the group using the medicated gum was 75 per cent lower than that of the group using the unmedicated gum and 80 per cent lower than the group using no gum at all. Among those who chewed the medicated gum 60 per cent did not develop any new carious lesions during the 12 month study as contrasted with 7 per cent among those who chewed the unmedicated gum and 2 per cent among those who did not chew any gum.

The authors concluded that although the number of subjects in this study was small, and the findings could thus only be considered to be preliminary, the results would seem to indicate that a sugar-free chewing gum containing nitrofuran may be of value in the prevention of human dental caries. They concluded that there was no significant statistical difference between the caries increments in Groups 2 and 3.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